Improving the Engineer Battalion's Combat Power:

Lessons Learned in Iraq

U.S. Army photo by SPC Derek Gaines

By Captain Aaron P. Magan

The 326th Engineer Battalion (Combat)(Air Assault), based at Fort Campbell, Kentucky, is a part of the 101st Airborne Division (Air Assault). On 6 February 2003, the battalion received deployment orders to Mosul, Iraq, in support of Operation Iraqi Freedom. Although the unit accomplished all its assigned missions and suffered no combat losses from a lack of training or resources, its combat power could be far greater. This article examines the successes and challenges of the battalion, based on the current modified table of organization and equipment (MTOE), and offers recommendations as to the direction future equipment fielding plans and training scenarios should take.

Predeployment and Training

With the clarity of hindsight, it is apparent that some of the predeployment preparations and training events were crucial to our success, and others need some refinement. The division conducted a deployment exercise that proved invaluable as it allowed the unit to—

- Verify load plans based on the newly received shipping containers.
- Identify and requisition blocking, bracing, and shoring requirements.
- Sort hazardous material paperwork and packaging.
- Identify and weigh secondary vehicle loads.
- Update deployment equipment lists so that ships and trains could be reserved based on the unit's equipment footprint.

In short, the deployment exercise accurately reflected the complexity of moving an entire unit with all its associated equipment like no combat training center (CTC) rotation or home station field training exercise ever has. In addition, neither CTC nor home station training scenarios accurately reflected the nature of urban combat operations that we experienced in Iraq or the volume of enemy weapons and ammunition caches.

Urban Operations

In urban operations training conducted before deployment, an impregnable position was continually pursued, resulting in a meat-grinder-type of urban operation attack that consumed soldiers at an alarming rate. In actual practice in Iraq, a sniper or enemy position in a building meant that the floor of that building—or more often than not the entire building—was destroyed by a tube-launched, optically tracked, wire-guided (TOW) missile; an AH-64 or OH-58 helicopter; a tank main gun round; a shoulder-launched multipurpose assault weapon-disposable (SMAW-D); or an AT-4 light antitank weapon. It was reassuring to see that commanders did not continue to send soldiers into a faulty urban operations attack as is frequently seen in training.

An exchange training program within the XVIII Airborne Corps should be established between 3d Infantry Division and the 101st Airborne Division where mechanized company teams and light infantry battalions are rotated into each other's home station training scenarios. The CTCs do a better job than home station training at integrating mechanized forces in an urban operations attack.

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Explosive Ordnance Disposal

Engineers are masters of the "pop-and-drop" hand-emplaced explosive charges for destroying unexploded ordnance (UXO), ammunition, and equipment in limited quantities. However, when dealing with multiple truckloads of ammunition and equipment, standard methods and techniques do not apply. A poorly constructed shot will only create more problems and scatter the now-sensitized ammunition and explosives over a larger area.

With the manpower limitations of explosive ordnance disposal (EOD) teams, it was not possible for them to inspect and/or destroy every cache, so it fell to the engineers to take over the task. None of the standard engineer courses train engineers to deal with proper destruction of such large caches and, as a result, we have to learn by trial and error. Additionally, engineers are not currently trained in any of the Engineer School courses to identify enemy ammunition and explosives, especially when those items have been involved in fires and engineers are required to recommend which items are safe for removal and which must be destroyed in place.

Engineer units need embedded EOD/UXO experts. Based on our experiences in Iraq, the right number is two per platoon. Possible methods for achieving this goal are a joint training program, an additional skill identifier, a change to the program of instruction in the Engineer School, or a change to the MTOE.

Operation Iraqi Freedom

The actual process of deploying went more smoothly than most expected. The usual inconveniences of delayed planes, trains with the wrong combination of car types, and transloaded ships still occurred. We provided two supercargo personnel to accompany the equipment on the ship and sent two advanced-party personnel to secure accommodations at the destination, but little else could have been done that would benefit the unit during the deployment process.

We recommend that the battalion continue to provide a download, maintenance, and reception command and control node at the seaport of debarkation and possibly expand it to cover the aerial port of debarkation as well. That node requires the battalion executive officer and maintenance officer to be an effective reception, staging, onward-movement, and integration (RSOI) multiplier. When properly resourced, they can track incoming equipment, stage downloaded equipment, organize convoys, manage the driver pool, provide maintenance support, and direct incoming personnel.

Every vehicle needs at least one spare tire, already inflated and mounted on a rim. Upon arrival in theater, the initial convoys were briefed regarding distances, and units were cautioned about desert-specific maintenance problems, such as lubrication and air filters, but road conditions were never specifically mentioned. The combination of poor roads, overloaded vehicles, and the debris of war meant that tires were constantly in short supply. A high-mobility, multipurpose, wheeled vehicle (HMMWV) with a flat tire may get soldiers out of the immediate area, but it will not allow them to continue on a convoy for any distance.

M-220 TOW missile

HMMWV scissor jacks need to be replaced with tower jacks (sometimes called bumper jacks or shepherd's jacks) because the original equipment is inadequate. *A tire patch kit is also invaluable.* The kits are inexpensive and require little training to use, making them ideal for each platoon to carry.

Tow bars should be authorized at a minimum of one per platoon. Our unit purchased tow chains before the deployment for every vehicle because of a shortage of tow bars. While effective and relatively inexpensive, it is not the safest way to tow a vehicle. *Additionally, each squad HMMWV needs a self-recovery winch to allow for independent operations.*

In the town of Al Kifl, Iraqi forces had prepared bridges for demolition. Engineers were called on to render the demolitions safe and remove the explosives from the bridge. While this mission was safely accomplished, *embedded EOD personnel would have been an invaluable asset for this mission.*

The Iraqi town of Karbala presented a different type of urban operation than we were used to encountering. As opposed to a village of 40 personnel, as is found at the CTCs or at home station, we attacked a city of 700,000. There was no outer perimeter wire or antipersonnel minefields that ringed the city. Instead, units moved from the landing zone directly into the city and faced no opposition for the first few blocks. However, once the units were inside the city, they faced sniper fire, rocket-propelled grenade ambushes, and sporadic mortar attacks. Without the typical array of obstacles, engineers fought as infantry during the attack and provided limited mobility support. They encountered no enemy-emplaced explosive obstacles. Coalition dual-purpose, improved conventional munitions (DPICMs) were the most frequently

encountered UXO, but they could easily be avoided by dismounted personnel. All roadblocks were hand-emplaced by locals and could be removed by hand to allow mechanized forces to pass through. The primary method of mobility support provided by engineers during this operation was the use of bolt cutters to gain access into buildings and compounds. Explosives were still used initially to create breaches into walls, but it ultimately proved faster to use a tank main gun round to create personnel breaches. Often the greater engineer mission occurred once the unit had gained access to the compound and discovered enemy caches.

The magnitude of the caches that the Iraqis had hidden within their population centers meant that entire battalions had to be diverted to begin removing enemy weapons, ammunition, and equipment from the city of Baghdad in order to create a safe environment for the civilians in the newly liberated city. Again, engineers made recommendations to the maneuver units concerning which items were safe to transport out of the city and which must be destroyed in place. We underestimated the amount of demolitions and, more specifically, the number of initiating systems that would be required. Many of the caches had been involved in fires, rendering them unsafe for removal.

Locals had begun breaking apart shells, throwing down the fused warhead, dumping out the propellant, and taking the brass shell casing to sell on the black market. This produced large piles of highly flammable propellant that took only one spark to set off, thereby cooking off many of the warheads lying around. This occurred time and time again all over Iraq and required more Class V supplies than we could carry to destroy it all. What could be transported was hauled to a consolidated cache collection point by the family of medium tactical vehicle (FMTV) trucks that augmented the engineer platoons, as well as all available cargo trucks from the brigade.

Unit basic loads (UBLs) must be adjusted to reflect a dual command-detonated initiation requirement using modern demolition initiator (MDI) shock tube/cap assemblies only. In an urban environment, or in an area where we do not control the airspace, we cannot afford to have explosives set off with a time fuse. It is often difficult, and sometimes impossible, to block off every avenue of approach within a city that leads to a prepared demolition charge. Should the primary command-detonation initiating system fail, we are forced to wait until the time fuse detonates the charge. In the meantime, aircraft can fly overhead, or civilians can wander too close to the prepared demolition. In the future, both the primary and secondary initiating systems should be command-detonated. We were unprepared for this, and while we did not have any mishaps, we also did not have enough of the command-detonated initiating systems on hand to prepare each charge as we would have liked.

Line engineer companies were tasked with opening routes that had been bombed by the U.S. Air Force, as well as Iraqi engineers. A line engineer company has the organic assets to fill in a crater and/or create a bypass. Engineers can sweep the area for UXO before the repair begins, but the end result is a road that is a combat trail at best. Although adequate for military vehicle traffic, to include heavy equipment transporters loaded with M1 tanks, it was difficult for civilian traffic to navigate these roads or newly created bypasses. The engineer work line described in doctrinal manuals lagged far behind the divisional maneuver units. This resulted in 101st Airborne Division engineers clearing and repairing routes through the sectors of three different divisions.

The diversity of missions given to engineers in stability and support operations surprised most people. Road repair, chemical spill response, unstable structure demolition, river interdiction, cache destruction and transport, UXO destruction, route reconnaissance and classification, and a number of other tasks forced us to consolidate the engineer company under the engineer company commander within the brigade combat team. Platoon leaders remained with their task forces and took at least one squad with them each day to respond to missions in each task force sector. The rest of the company became general support to the brigade and worked on taskings generated by daily Civil-Military Operations Center meetings.

Often, engineers massed efforts on missions that did not necessarily represent what was typically thought of as the engineering main effort but rather supported the overall information operations campaign. This approach seemed to work well for us in the northern Iraqi city of Mosul. We often tackled easy engineering victories (such as reopening a roadway for civilians or clearing UXO from a school yard) even though there were more important roads or UXO fields. This allowed us to get the local civilians on our side and showed them that we were interested in helping them reconstruct their country.

Future Organizational Structure

With a rapid runway repair box and two Bobcat® skid steer tractors per line company, the division could double its runway repair capability and add enormous utility to the line company and subsequently its supported brigade. The division seized several airfields, three of which required repairs. Currently, only the division's light equipment company has the airfield repair matting and other required equipment. With the proper reinforcement, a rapid runway repair box could accommodate the weight of two Bobcats and reduce the haul requirement to only one additional truck and trailer. Engineer line companies already have the rest of the required equipment (dozer and small emplacement excavator [SEE] truck). Another plus for the Bobcat is that it can be augmented with auger bits to provide dismounted survivability positions, a concrete mixer (which has been required several times during operations in Iraq), a pavement breaker, and other hydraulic tools.

Each platoon needs its own dedicated FMTV dump truck. An unmodified engineer squad HMMWV can safely carry an entire squad. However, three more load categories remain that require transport: the MTOE items, the soldiers' rucksacks

and "A" and "B" duffel bags, and the Class IV and V UBL. The trailer (another issue) can safely carry one of those three load categories. The rest is then left behind or strapped to the sides or top of the vehicle or trailer. The right answer is for each squad vehicle to transport the troops and the mission-essential MTOE items (troop seats are removed and replaced with equipment boxes bolted into the vehicle) and use the trailer to haul the Class IV and Class V UBL. The remainder of the MTOE items and soldiers' bags can then be transported by the platoon sergeant in the platoon FMTV dump truck. Additionally, the truck could be used to support engineer missions when they are attached to maneuver units.

During operations in Iraq, each platoon required the augmentation of a 5-ton-equivalent truck on a daily basis, because they transported enemy weapons and ammunition caches out of the various liberated cities. The ultimate goal should be to resource an engineer platoon for independent operations with the ability to carry all personnel and equipment in a single internal lift.

Line companies should have two additional dozers for a total of four organic dozers to help provide survivability support in the absence of any augmentation. Typically a line company is augmented with a platoon from the division's habitual corps light equipment engineer company. When this does not happen, the line company's two dozers will work around the clock and still take a minimum of six days to finish digging in the brigade commander's priorities for the entire combat team.

An interim solution would be to purchase the excavator that is available from a U.S. manufacturer in lieu of the winch currently found on the back of our dozers. Such an option would force the commander to choose between providing survivability berms with the dozer blade versus providing dismounted survivability positions with the excavator. However, dismounted positions can still be constructed by hand until the dozer arrives, and the previously requested additional two dozers would free up the assets more quickly. In practice, blade assets are used nonstop at the beginning of operations, but that usage quickly scales back after a unit has been in place for a week or more. After the initial flurry of activity, only occasional sanitation trenches and force protection or road repair missions require blade assets.

A HMMWV-based contact truck should be added to the MTOE. Sapper companies currently have their own maintenance sections based on our own battalion internal reorganization. However, they need a HMMWV contact truck as opposed to the older excess commercial utility cargo vehicle (CUCV) that is currently on hand.

The company is one HMMWV short of what is required. The first sergeant needs a vehicle and so does the assistant brigade engineer. Currently, it is one or the other. *The company also needs to be authorized an operations noncommissioned officer (NCO).* Companies in our battalion currently pull the senior squad leader to fill this role.

A platoon-sized Kipper Tool kit would have greatly enhanced the level of support that engineers could have provided for the maneuver commander. Our unit purchased these tool kits using organizational money; however, they should be MTOE items fielded by the Army. Kipper Tool's base camp construction kit was long overdue, and we used it nonstop in Iraq.

Engineer equipment fielding should be on the same schedule as the supported infantry unit. Currently, engineers are the only habitual slice element that fights dismounted alongside the infantry, yet they are continually left out of the new equipment fielding plans.

We need to maintain a general support engineer team within the headquarters platoon to react to small incidents. There are always brigade-controlled areas such as the brigade support area, brigade TOC, forward area rearming and refueling points, and primary assembly areas where engineers have to go to react to a single UXO incident or provide transport of a few rounds of enemy ammunition. When engineers are consolidated under the engineer company commander, he can dispatch a squad to deal with the smaller engineer missions.

The assault and obstacle (A&O) platoon leader should be made a permanent MTOE position. The line engineer companies have consolidated all engineer blade assets as well as the Volcano mine system into an A&O platoon. In this battalion, each platoon is resourced "out of hide" with a lieutenant as the platoon leader, and the heavy equipment section NCO in charge generally serves as the platoon sergeant. This structure has served us well both in training and in combat. The notion of using the task force or brigade command sergeant major as the synch-dozer never really worked as well as it's briefed. However, with the dig assets under the control of an A&O platoon leader, we have developed a more efficient survivability section that is capable of simultaneous missions.

Summary

The diversity of missions and extended distances at which engineer units have operated during Operation Iraqi Freedom highlight the need for updating the type of training, organizational structure, and equipment fielding plan. Months—not years—is the appropriate timeline for these changes. There is still time to affect the fight in Iraq and improve the capabilities of the deployed units in this ultimate proving ground for engineers.

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